

Unlock the Business Value of Your Data with Enterprise Business Intelligence

SAS®9 Running on Dual-Core Itanium® 2-based Servers Delivers Comprehensive, Integrated Business Intelligence

The Tremendous Value Waiting in Your Data

Business intelligence (BI) – the ability to capture, store, find, analyze and present information to make better decisions – has grown from being a backroom application used for a limited set of business problems into a strategic enterprise capability essential to maintaining competitiveness. The drivers of this transformation have been the same challenges you face daily:

- **The relentless increase in data volumes** due to market fragmentation, globalization, greater product and service complexity, and increased requirements for collaboration between partners and across supply chains.
- **The growing awareness that data does not equal business value** until it is filtered, analyzed and delivered to the right user at the right time.
- **The simple fact that your (and your competitors') information assets contain tremendous value** that – if unlocked – will yield sustainable business advantage.

But the challenges to gaining “true BI” can be formidable. Your enterprise data likely exists in multiple isolated “silos,” each with its own nonstandard set of data tools. Your users are disparate, so any comprehensive BI solution would need to build in flexibility across functions, business units and the varying requirements of different users. None of your challenges are static, so a BI solution must be adaptable and extensible to meet tomorrow's requirements while protecting today's investments. And as always, your IT capacity is finite and your budgets are limited.



The Answer: Enterprise Business Intelligence

The solution that can meet these challenges and fulfill the promise of robust BI is an enterprise business intelligence solution from SAS and Intel. Unlike previous BI tools that result in multiple different approaches across an organization, an enterprise BI solution is comprehensive and standardized; it allows you to meet the needs of widely differing users and leverage information assets across your organization while lowering costs and

Lower Cost, Higher Performance and Greater Influence at Danish Fisheries

By supplying accurate and easy-to-use data on fish catches, the Danish Directorate of Fisheries (DDF) keeps Danish negotiators ahead of the game when hammering out EU regulations and quotas. The data is vast, covering fish numbers and species landed in 340 locations across Denmark. The information must be available quickly, the data accurate and the reports easy to use by control personnel, planning staff, EU negotiators and fishermen. In the constantly shifting environment of fishing quotas, SAS running on Itanium 2-based servers provides super-swift number crunching in a flexible, user-friendly form. Gert Thstrup, Deputy IT Chief at the DDF, explains, “We collect data from several different sources: catch figures from vessels, sales notes from auctions, and sales companies. We looked around the market and chose SAS because it is the best when working with large amounts of data.”

“The HP Integrity server raised performance by at least a factor of 10.”

Gert Thstrup, Deputy IT Chief, DDF

In 2005, the DDF migrated its SAS software to HP Integrity* servers with Intel Itanium 2 processors, enabling it to take full advantage of 64-bit architecture. The decision to invest was driven by a desire to maintain the DDF's position as a fisheries directorate at the cutting edge of technology. The move to Itanium 2-based servers has helped the DDF earn a reputation as one of the best, fastest and most accurate reporters in the EU. “We are known to have some of the best data and data quality in the EU,” says Thstrup. Beyond regulatory compliance, the DDF's SAS solutions help the agency to spot trends in fish species. “We can predict and solve problems before most other countries even begin looking at them.” The performance results have been beyond expectations. “The HP Integrity server raised performance by at least a factor of 10,” says Thstrup. The change has resulted in a reduction in costs as well, with an expected payback period of just two and a half years.

maximizing flexibility. These solutions combine data capture, data integration, predictive analytics and information deployment and presentation – helping you to turn the data flood into meaningful, available information you can count on and deliver it to the right user at the right time. This empowers your users to do things they couldn't do before:

- Ask new questions
- Explore new options
- Discover new opportunities
- Maximize strategically differentiating attributes
- Spot problems earlier
- Predict and prevent problems

Organizations as varied as Amazon, Nedcor Bank and Harrah's are using enterprise BI to create competitive advantage. Are you ready to lead?

Enterprise Business Intelligence from SAS and Intel

With a relationship spanning more than 10 years, SAS and Intel have a strong history of working together to create solutions that solve real business problems in the most cost-effective manner. Now we have collaborated to optimize the performance of SAS®9 for the new Dual-Core Intel® Itanium® 2 processor-based servers to deliver enterprise business intelligence with unprecedented performance, scalability and reliability.

SAS applications running on Dual-Core Itanium® 2-based server platforms comprise an integrated solution that delivers end-to-end business intelligence capabilities including online analytical processing (OLAP); data mining; extract, transformation, and load (ETL) tools; data warehousing; and full reporting resources. This functionality allows you to seamlessly build and deploy robust business intelligence applications while controlling costs. SAS ETL tools are optimized on Itanium®-based platforms, helping organizations to more easily integrate and analyze data from multiple heterogeneous information sources.

SAS®9 is a true *enterprise* business intelligence solution that integrates individual technology components optimally within your existing IT infrastructure into a single, unified system – the SAS® Enterprise Intelligence Platform. Its comprehensive suite of business intelligence software, operating on Dual-Core Itanium 2-based servers, provides you with an optimized and cost-effective solution. Comprising SAS Data Integration, SAS Intelligence Storage, SAS Analytics and SAS Business Intelligence, this solution simplifies your business intelligence environment while unlocking the value of your data through these key characteristics:

- **Consistent.** With the ability to integrate, share and centrally manage metadata across enterprises, SAS creates one common view of the data and eliminates information silos and the costs of maintaining them.
- **Open.** Integrates with a wide variety of data and metadata sources to support information flow across diverse and disjointed IT environments.
- **Unified.** Shares common security and administration services, data storage and management functions, query and reporting tools, analytic toolsets, publishing infrastructures, and Web-based user interfaces across components and applications.
- **Powerful.** Best-in-class analytics and data integration create an easy-to-use BI platform.
- **Fast.** Utilizes the mainframe-class power of Dual-Core Intel Itanium 2 processors to know more and know faster.
- **Standards-based.** Supports industry-standard protocols, programming languages, models and communications interfaces.
- **Extensible.** Enables customers to build custom solutions using standard development environments (such as Java) and well-documented application programming interfaces.

PREMIER Bankcard's Growth is Driven by High-Performance Analytics

PREMIER Bankcard serves an underserved yet creditworthy market. Since its founding in 1989, it has offered credit cards to customers who in the past have had a poor-performing credit history, and has helped millions of individuals and families establish or re-establish their credit. The company is now among the top 14 credit providers for both Visa and MasterCard, with approximately 2.7 million active credit card accounts. PREMIER Bankcard is experiencing dramatic growth, adding roughly 160,000 new accounts each month.

The success of credit card providers depends largely upon their ability to analyze data about new and existing customers. Enterprise-class business intelligence capabilities are therefore a highly prized strategic asset for credit card providers looking to maintain high levels of growth and profitability.

"HP Integrity servers based on the Intel Itanium 2 processor are key to meeting our business intelligence needs."

Dave Geiver, Vice President of Technology,
PREMIER Bankcard

When PREMIER Bankcard looked at how to sustain continued explosive growth in its customer base and maintain high profitability, it chose Intel Itanium 2-based HP Integrity servers running SAS, Microsoft Windows Server 2003* and 64-bit SQL Server 2000* to fuel its mission-critical business intelligence activities. The company's solution is enabling sophisticated analytical research on the credit card market, the company's cardholder base, and future individual transactions to stay one step ahead of the market and the competition.

"HP Integrity servers based on the Intel Itanium 2 processor are key to meeting our business intelligence needs, including support for Microsoft SQL Server and SAS," says Dave Geiver, Vice President of Technology, PREMIER Bankcard. "We are now reaping the benefits of a 30 to over 100 percent performance improvement over our previous 32-bit solution, enabling us to make better business decisions, faster, and also giving us the headroom to sustain our 8 percent annual growth rate."

Better Customer Visibility Drives Growth and Profitability at Nedcor

Nedcor Limited, one of South Africa's "big four" banks with total assets of US\$49 billion, excels by providing a range of innovative, flexible and secure financial services combined with the best possible customer experience. To do this consistently, the bank must integrate its business across multiple channels, extend services to "unbanked" individuals and communities, and enhance profitability in all areas of service. The ability to measure performance, profitability and operational risk in across wide variety of banking endeavors and customers is key to this success.

Nedcor operates a data warehouse to conduct customer relationship management (CRM) initiatives and to analyze operational data. But it was becoming clear that the limited abilities and headroom of their current data warehouse solution were insufficient to support the bank's continued growth. "Our data processing and analysis requirements put increasing strain on our systems," says Adrian Mattioli, Retail Data Warehouse Delivery Manager at Nedcor. "Not only were we facing serious limitations when building additional data marts, but we were also having system performance issues when even small numbers of users ran reports. We wanted to expand our business intelligence operations and gain a single view of the customer, whilst also eliminating the performance issues."

To meet these challenges, the bank deployed a new data warehouse solution based on SAS®9.1 Business Intelligence 64-bit applications running on a Unisys ES7000* server powered by 12 Intel Itanium 2 processors.

"We also have the freedom and scalability to build and deploy highly effective risk management and profitability analysis solutions."

Adrian Mattioli, Retail Data Warehouse
Delivery Manager, Nedcor

SAS®9.1 benefits greatly from the parallel processing power enabled by the Intel Itanium 2 processor's EPIC (Explicitly Parallel Instruction Computing) technology. Whereas the old solution had reached its limits with 2.2 TB of data, the power of SAS®9.1 running on the Itanium 2-based server now manages a total of 8 TB of data, including 8 new data marts. In addition, the data warehouse is growing at 100 GB per month and will scale to handle 45 TB over the next five years.

"Some of the data processing jobs that we perform previously took two days. Now, the same tasks are complete in a couple of hours," notes Mattioli. "Previously, updating the data marts was a weekend-long operation. Where it failed to complete in time, users would have to work with inconsistent data. Now, everyone that uses the system says that performance is an order of magnitude better." In addition to improving performance on current processes, the solution is enabling new business tools. "As well as all the customer-facing initiatives enabled by the new architecture, we are also building data marts to prevent fraud and money laundering," explains Mattioli. "We also have the freedom and scalability to build and deploy highly effective risk management and profitability analysis solutions."

SAS®9.1 on Itanium 2-based servers enables Nedcor to continue to grow – by better understanding their customers, delivering consistent service across all channels, and driving continually improving profitability.

- **Portable.** Allows applications to be moved between systems and platforms based on changing needs for growth and maintenance.
- **Compatible.** Fits into an organization's IT practices, skills, methodologies and infrastructure in a way that leverages existing technology investments.
- **Future-ready.** Scalable to handle future growth, customizable to support unique new applications, and standards-based to support future technologies not yet defined.

The Dual-Core Foundation for Performance, Flexibility and Lower TCO

SAS®9 leverages the breakthrough capabilities of the new Dual-Core Intel Itanium 2 processor to deliver the performance and reliability needed to serve your business intelligence users. Intel's advanced dual-core technology brings unprecedented levels of performance, reliability and energy-efficiency to Itanium 2-based servers:

EPIC Architecture. Explicitly Parallel Instruction Computing (EPIC) is the cornerstone of the Intel® Itanium® architecture. It provides a variety of advanced implementations of parallelism, predication, and speculation, resulting in superior Instruction-Level Parallelism (ILP) to help address the current and future requirements of high-end enterprise and technical workloads. This architecture is built from the ground up for the most demanding applications, made possible by high levels of compute parallelism, massive caches, and processor execution resources.

Optimized for data-intensive computing. With mainframe-class reliability-availability-serviceability (RAS), Intel® Virtualization Technology[†] for hardware-assisted virtualization, multiple CPUs, very large memory bandwidth and wide-open data paths, the Dual-Core Intel Itanium 2 processor provides the scalability and high performance that makes analysis feasible in a timely manner.

Dual-Core Processing. The Dual-Core Intel Itanium 2 processor is Intel's first product in the Itanium processor family with two complete 64-bit cores on one processor.

Intel® Hyper-Threading Technology¹. The Dual-Core Intel Itanium 2 processor is also the first member of the Intel Itanium processor family to include Hyper-Threading Technology, which provides four times the number of application threads provided by earlier single-core implementations.

24 MB On-Die L3 Cache. The Dual-Core Intel Itanium 2 processor features up to 24 megabytes of low-latency on-die L3 cache, nearly three times the amount provided by yesterday's Intel Itanium 2 processor, providing high bandwidth to the two cores. This generous on-die L3 cache combined with dual-core processing and Hyper-Threading Technology provides twice the performance of yesterday's Intel Itanium 2 processor.

Intel® Virtualization Technology. The Dual-Core Intel Itanium 2 processor includes hardware-assisted virtualization support that helps increase virtualization efficiency and broadens operating system compatibility. In conjunction with dual-core performance improvements and unparalleled scalability advantages, Intel Virtualization Technology makes Dual-Core Itanium 2-based systems an excellent platform for data-intensive virtualization.

Intel® Cache Safe Technology. This new technology enables high-end systems to operate even in the event of errors in the L3 cache that can bring systems down. Intel Cache Safe Technology minimizes cache errors and helps ensure mainframe-caliber availability.

Outstanding Energy Efficiency. The Dual-Core Intel Itanium 2 processor uses up to 20 percent less power than yesterday's Intel Itanium 2 processor, enabling 2 times higher performance per watt, lowering energy requirements while providing significant performance improvements.¹

Impressive Price/Performance. Dual-Core Intel Itanium 2 processors continue the Intel Itanium processor family legacy of providing extremely attractive price/performance for data-intensive applications. They provide mainframe-class performance and reliability without the mainframe price tag.

Security Features. The Intel Itanium 2 processor has a number of unique features to support best-in-class data center security. These include faster data encryption, robust memory compartmentalization (via enhanced paging architecture), and hardware authentication of firmware.

IA-32 Application Support. Itanium 2-based servers have always supported IA-32 application to ease the transition for customers migrating from other processor architectures. The IA-32 Execution Layer enhances this capability, providing improved performance and flexibility. The IA-32 Execution Layer is supported by Microsoft Windows* and Linux* operating systems.

The combined power of SAS®9 and the Dual-Core Intel Itanium 2 processor delivers outstanding BI capabilities. Deeper real-time analysis of terabytes of data and the ability to generate reports on enormous data sets with reduced processing effort give your company business advantages you've never had before. And the efficient execution of complex data-mining algorithms and high transaction volumes helps ensure that your business intelligence can keep up with your business.

Deploying Your Enterprise Business Intelligence

Deploying an enterprise business intelligence solution is a strategic decision with far-reaching impacts. A solution based on SAS®9 and Dual-Core Itanium 2-based servers brings one comprehensive BI platform to your enterprise, maximizing your flexibility and keeping your costs down. And Intel and SAS continue to work together to persistently improve business intelligence and predictive analytics solutions – to help your enterprise predict outcomes and make more effective decisions.

For more information on SAS®9 running on Dual-Core Itanium 2-based servers contact your SAS or Intel representative or see our Web sites at:

www.sas.com/sasintelbi

www.intel.com/go/itanium

Solution provided by:



¹Performance measured using OLTP (NT/SQL), SPECjbb2005, SPECintCPU, Linpack, and SAP-SD. Intel Internal Measurement (March 2006) comparing system configurations of Dual-Core Intel® Itanium® 2 processor 1.6 GHz with 24 MB L3 cache to Intel Itanium 2 processor 1.6 GHz with 9 MB L3 cache. Actual performance may vary. See <http://www.intel.com/performance/server/itanium2>.

⁴Hyper-Threading Technology requires a computer system with an Intel® Itanium® processor supporting HT Technology and a HT Technology enabled chipset, BIOS and operating system. Performance will vary depending on the specific hardware and software you use. See www.intel.com/homepage/land/hyperthreading_more.htm for additional information.

¹Intel® Virtualization Technology requires a computer system with an enabled Intel® processor, BIOS, virtual machine monitor (VMM) and, for some uses, certain platform software enabled for it. Functionality, performance or other benefits will vary depending on hardware and software configurations and may require a BIOS update. Software applications may not be compatible with all operating systems. Please check with your application vendor.

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